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CAIN, EDWARD J	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/807,025
Filing Date: March 22, 2004
Appellant(s): REHMAN ET AL.

GARY P. OAKESON
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12 MAY 2008 appealing from the Office action mailed 15 JANUARY 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claim

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,571,311	BELMONT ET AL	11-1996
6,214,100	PARAZAK ET AL	04-2001
5,889,083	ZHU	03-1999
6,874,881	SUZUKI ET AL	04-2005
6,280,513	OSUMI ET AL	08-2001
6,652,055	OIKAWA ET AL	11-2003
2005/0027035	WANG ET AL	02-2005
2002/0198287	OHTA ET AL	12-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 21-26 and 28-29 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al '035 in view of evidence supplied by Belmont et al '311.

Wang et al. disclose ink jet ink comprising water, 0.01-50% co-solvent, O. 1-10% styrene-maleic anhydride, O. 1-5% surfactant, and O. 1-10% Self-dispersing pigment possessing particle size of 0.005-1 jam. It is noted that the styrene-maleic anhydride includes that known under the tradename SMA-1000H that has weight average molecular weight of 5,500. For specific types of self-dispersing pigments, Wang et al. points to Belmont et al. that discloses (col.4, lines 7-16 and col.5, lines 4-21 and 31-33) acid-functionalized pigment, i.e. pigment having organic group attached thereto wherein

the organic comprises alkyl group and at least one acid group (paragraphs 1, 13, 17, 19-21, 24, 27, 42, 44, and 46).

Attention is drawn to black ink #3 (paragraph 56) that comprises 0.5% ammonium benzoate, 0.35% TRIS buffer, 7.5% 1,5-pentanediol, 7.5% 2-methyl-l,3-propanediol, 4.5% 2-pyrrolidone, 0.15% surfactant, i.e. Surfynol, 3% self-dispersing pigment, and 0.8% styrene-maleic anhydride, i.e. SMA-1000H.

Given that Wang et al. disclose ink identical to that presently claimed, it is clear that the ink is inherently reliably jettable at all firing frequencies ranging from 3-25 kHz and inherently reliably jettable at drop volume from about 10 pL to 20 pL.

In light of the above, it is clear that Wang et al. anticipate the present claims.

Claims 1-3, 6, 8, 11-13 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al '100 in view of Zhu '083 and Suzuki et al '881.

Parazak et al. disclose a system for printing images onto substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10 pm, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting the ink onto the substrate (col.1, lines 13-20, col.2, lines 35-37, col.3, lines 19-30 and 56-61, col.4, line 15, col.4, lines 41-43 and 54-56, col.4, line 64-col.5, line 1, and col.5, lines 33-40). Attention is drawn to col.5, lines

33-40 that disclose ink comprising 3% modified pigment, 5% ethoxylated glycerol, 9% 2-pyrrolidone, 2% 1,5-pentanediol, and water. It is disclosed that the modified pigment is acid functionalized wherein the acid precursor used to form the modified pigment is isophthalic acid.

The difference between Parazak et al. and the present claimed invention is the requirement in the claims of (a) styrene-maleic anhydride and (b) printhead configured for specific firing frequency and drop volume.

With respect to difference (a), Zhul which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate wherein the binder has weight average molecular weight of 1,500-50,00. Attention is called to col.5, lines 63-65 of Zhu that discloses styrene-maleic anhydride with weight average molecular weight of 5,600 (col.4, lines 47-51 and 62-67 and col.5, line 57-col.6, line 9).

Given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at firing frequencies ranging from 3 kHz to 25 kHz as presently claimed.

With respect to difference (b), Suzuki et al. disclose ink jet printer that ejects ink of 20 pLor less and that possesses firing frequency of 10 kHz or higher (col. 10, lines 31-37) in order to produce high quality image printing at high speed (col. 10, lines 31-37).

In light of the motivation for using styrene maleic anhydride disclosed by Zhu as described above and for using printer configured for specific firing frequency and drop

volume disclosed by Suzuki et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used styrene-maleic anhydride in the ink of Parazak et al. in order to produce ink with good colorant adhesion to substrate, i.e. produce ink with good smudge resistance, durability, etc., and to use such printer in the system of Parazak et al. in order to produce ink that produce high quality image printing at high speed, and thereby arrive at the claimed invention.

Claims 4-5 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Suzuki et al and further in view of Osumi et al '513.

The difference between Parazak et al. in view of Zhu and Suzuki et al. and the present claimed invention is the requirement in the claims of ammonium benzoate.

Osumi et al., which is drawn to ink jet ink, disclose the use ammonium benzoate in order to produce a waterfast image that possesses good re-ejection characteristics from the printer (col.9, lines 60-67).

In light of the motivation for using ammonium benzoate disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use ammonium benzoate in the ink ofParazak et al. in order to produce waterfast ink that possesses good re-ejection characteristics from the printer, and thereby arrive at the claimed invention.

Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Suzuki et al and further in view of Ohta et al '287.

The difference between Parazak et al. in view of Zhu and Suzuki et al. and the present claimed invention is the requirement in the claims of trishydroxymethylaminomethane.

Ohta et al., which is drawn to ink jet ink, disclose the use of trishydroxymethylaminomethane as pH buffer in order to control the pH of the ink and to produce durable, stable ink (paragraph 107).

In light of the motivation for using trishydroxymethylaminomethane disclosed by Ohta et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use trishydroxymethylaminomethane in the ink of Parazak et al. in order to produce durable, stable ink with desired pH, and thereby arrive at the claimed invention.

Claims 21-23, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu.

Parazak et al. disclose a system for printing images onto a substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10 p.m, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There

is also disclosed a method of ink jetting the ink onto the substrate (col.1, lines 13-20, col.2, lines 35-37, col.3, lines 19-30 and 56-61, col.4, line 15, col.4, lines 41-43 and 54-56, col.4, line 64-col.5, line 1, and col.5, lines 33-40).

Attention is drawn to col.5, lines 33-40 that disclose ink comprising 3% modified pigment, 5% ethoxylated glycerol, 9% 2-pyrrolidone, 2% 1,5-pentanediol, and water. It is disclosed that the modified pigment is acid functionalized wherein the acid precursor used to form the modified pigment is isophthalic acid.

The difference between Parazak et al. and the present claimed invention is the requirement in the claims of styrene-maleic anhydride.

Zhu, which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate wherein the binder has weight average molecular weight of 1,500-50,00. Attention is called to col.5, lines 63-65 of Zhu that discloses styrene-maleic anhydride with weight average molecular weight of 5,600 (col.4, lines 47-51 and 62-67 and col.5, line 57-col.6, line 9).

Given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at all firing frequencies from 3 kHz to 25 KHz.

In light of the motivation for using styrene maleic anhydride disclosed by Zhu as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used styrene-maleic anhydride in the ink of Parazak et al. in order to produce ink with good colorant adhesion to substrate, i.e. produce ink with good smudge resistance, durability, etc., and

thereby arrive at the claimed invention. Parazak et al. disclose system for printing images onto Substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment
having mean diameter of 0.005-10 p.m, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting

Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and further in view of Osumi et al.

The difference between Parazak et al. in view of Zhu and the present claimed invention is the requirement in the claims of ammonium benzoate.

Osumi et al., which is drawn to ink jet ink, disclose the use ammonium benzoate in order to produce waterfast image that possesses good re-ejection characteristics from the printer (col.9, lines 60-67).

In light of the motivation for using ammonium benzoate disclosed by Osumi et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to use ammonium benzoate in the ink of Parazak et al. in order to produce waterfast ink that possesses good re-ejection characteristics from the printer, and thereby arrive at the claimed invention.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Suzuki et al and further in view of Ohta et al '287.

The difference between Parazak et al. in view of Zhu and the present claimed invention is the requirement in the claims of trishydroxymethylaminomethane.

Ohta et al., which is drawn to ink jet ink, disclose the use of trishydroxymethylaminomethane as pH buffer in order to control the pH of the ink and to produce durable, stable ink (paragraph 107).

In light of the motivation for using trishydroxymethylaminomethane disclosed by Ohta et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used trishydroxymethylaminomethane in the ink of Parazak et al. in order to produce durable, stable ink with desired pH, and thereby arrive at the claimed invention.

Claims 1-3, 6, 8, 11-13 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and further in view of Oikawa et al '055.

Parazak et al. disclose a system for printing images onto substrate comprising ink jet ink and ink jet printer wherein the ink comprises water, 0.001-10% acid functionalized pigment having mean diameter of 0.005-10 pm, 0.01-50% co-solvent including 1,5-pentanediol, 2-pyrrolidone, and ethoxylated glycerol, 0.01-5% surfactant, and other acrylic or non-acrylic polymer to improve various properties of the ink. There is also disclosed a method of ink jetting the ink onto the substrate (col.1, lines 13-20,

col.2, lines35-37, col.3, lines 19-30 and 56-61, col.4, line 15, col.4, lines 41-43 and 54-56, col.4, line 64-col.5, line 1, and col.5, lines 33-40).

Attention is drawn to col.5, lines 33-40 that disclose ink comprising 3% modified pigment, 5% ethoxylated glycerol, 9% 2-pyrrolidone, 2% 1,5-pentanediol, and water. It is disclosed that the modified pigment is acid functionalized wherein the acid precursor used to form the modified pigment is isophthalic acid.

The difference between Parazak et al. and the present claimed invention is the requirement in the claims of (a) styrene-maleic anhydride and (b) printhead configured for specific firing frequency.

With respect to difference (a), Zhu, which is drawn to ink jet ink, disclose the use of styrene-maleic anhydride binder to fix colorant to substrate wherein the binder has weight average molecular weight of 1,500-50,00. Attention is called to col.5, lines 63-65 of Zhu that discloses styrene-maleic anhydride with weight average molecular weight of 5,600 (col.4, lines 47-51 and 62-67 and col.5, line 57-col.6, line 9).

Given that Parazak et al. in combination with Zhu disclose ink as presently claimed, it is clear that the ink intrinsically would be reliably jettable at firing frequencies ranging from 3 kHz to 25 kHz as presently claimed.

With respect to difference (b), Oikawa et al., which is drawn to ink jet printer, disclose setting the firing frequency of the printer to several tens of kHz in order to meet demands for faster printing and higher resolution (col.2, lines 19-23).

In light of the motivation for using styrene maleic anhydride disclosed by Zhu as described above and for using printer configured for specific firing frequency disclosed by Oikawa et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used styrene-maleic anhydride in the ink of Parazak et al. in order to produce ink with good colorant adhesion to substrate, i.e. produce ink with good smudge resistance, durability, etc., and to use such printer in the system of Parazak et al. in order to produce ink that produce high resolution image when printing at high speed, and thereby arrive at the claimed invention.

Claims 4-5 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Oikawa et al et al and further in view of Osumi et al '513.

The difference between Parazak et al. in view of Zhu and Oikawa et al. and the present claimed invention is the requirement in the claims of ammonium benzoate.

Osumi et al., which is drawn to ink jet ink, disclose the use ammonium benzoate in order to produce waterfast image that possesses good re-ejection characteristics from the printer (col.9, lines 60-67).

In light of the motivation for using ammonium benzoate disclosed by Osumi et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used ammonium benzoate in the ink of Parazak et al. in order to produce

waterfast ink that possesses good re-ejection characteristics from the printer, and thereby arrive at the claimed invention.

Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak et al in view of Zhu and Oikawa et al et al and further in view of Ohta et al '287.

The difference between Parazak et al. in view of Zhu and Oikawa et al. and the present claimed invention is the requirement in the claims of trishydroxymethylaminomethane.

Ohta et al., which is drawn to ink jet ink, disclose the use of trishydroxymethylaminomethane as pH buffer in order to control the pH of the ink and to produce durable, stable ink (paragraph 107).

In light of the motivation for using trishydroxymethylaminomethane disclosed by Ohta et al. as described above, it, therefore, would have been obvious to one of ordinary skill in the art to have used trishydroxymethylaminomethane in the ink of Parazak et al. in order to produce durable, stable ink with desired pH, and thereby arrive at the claimed invention.

(10) Response to Argument

Regarding the rejection of claims 21-26 and 28-29 under 35 USC 102(e) as being anticipated by Wang et al in view of evidence in Belmont et al, Appellants have

argued that the rejection is improper because "Wang never incorporates Belmont by reference".

It is the position of the examiner that Wang et al need not explicitly use the phrase "incorporate by reference" for the rejection to be proper under 35 USC 102(e). Wang et al do explicitly point to Belmont et al at paragraph 27 as describing pigments to be used in the Wang et al invention and Belmont et al is explicitly directed to ionically modified pigments and claims acid functionalized pigment at claims 10 and 11. It is the position of the examiner that the reference to Belmont et al by Wang et al is an explicit teaching that the pigments taught therein are suitable for the Wang et al invention.

Appellants have further argued that Wang et al fail to teach inks which are jettable at frequencies of 3-25 kHz. In the rejection of record the examiner argued that since the inks of Wang et al met the chemical limitations of the instantly claimed inks, the jettability characteristics would be inherent. Appellants have not demonstrated that such characteristics would not be inherent.

Regarding the rejection of claims 1-6, 8-9 and 11-19 under 35 USC 103 as argued by Appellants at pages 21-26 of the brief the examiner offers the following comments.

Appellants have argued that Zhu is not properly combined with Parazak since Zhu teaches away from the use of organic solvents as found in Parazak. It is the position of the examiner that since the inks of Parazak are aqueous with preferably 0.1 to 20 wt. % co-solvent (column 4, line 19) and the inks of Zhu are aqueous and

"typically" contain organic solvent in amounts of "below about 20%" (column 9, line 1), these references are, indeed, properly combined.

Appellants have argued that the Suzuki reference fails to teach printheads with the instantly claimed firing frequency. It is the position of the examiner that the teaching of drive frequencies of about 15 kHz is a clear teaching of firing frequencies within the range claimed by Appellants.

Appellants have argued that the inherency arguments presented by the examiner for jettability of the compositions taught by Parazak and Zhu are not proper. Appellants have not presented evidence in rebuttal of the inherency argument.

Appellants' arguments concerning the Oikawa reference seem, ultimately, to lead back to whether the combination of Parazak and Zhu teach inks which are jettable over the claimed frequency range. This argument has been addressed previously.

Regarding the rejection of claims 21-26 and 28-29 as argued by Appellants at pages 26-27, Appellants' arguments are a reiteration of arguments previously presented.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Edward J. Cain/

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